

ABSTRACT OF THE DISCLOSURE

A micro-nanometer precision servo pneumatic X-Y positioning table comprises by two slide air cylinders and drives the two slide air cylinders by the servo control rule to make the pneumatic table to get the purpose of X-Y two degrees of freedom precision positioning. However, the pneumatic servo system is a high time-variant and nonlinear system and the nonlinear friction force causes the stick-slip phenomenon of the servo pneumatic system. Therefore the micro-nanometer precision servo pneumatic X-Y positioning table in accordance with the present invention has a new velocity feedback compensation method to overcome the nonlinear friction force and the stick-slip phenomenon. The new method is to add a velocity compensation signal, which periodic frequency is larger than the system's natural frequency into the control signals. The method is to put the velocity compensation signal directly into the servo valve control signals. By this method, it is able to avoid the complex control rules and the calculation of the feedback compensation and to get higher precision positioning. The positioning precision of the micro-nanometer servo pneumatic X-Y positioning table is about the resolution of the linear scale (ex. in this case 20 nanometer, is the resolution of the used optical linear scale; if the resolution is 10 nanometer the precision can be also 10 nanometer) not only for long stroke but also for micro-step command.